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Portrayal of Productive Parameters of Marecha Camel Calves in Desert Ecosystem

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Abstract

The present study was aimed to investigate productive parameters like birth weight, weaning weights, daily weight gains along with husbandry & ethno veterinary practices of Marecha camel calves kept under diverse extensive conditions in Desert Thal Punjab. One hundred camel herders from Tahsil Mankera District Bhakkar (Thal desert) were selected. The birth weight was taken by using digital scales at birth, then the weaning weights, while growth rate was measured at fortnightly intervals. The growth rate was calculated by the current weight-previous weight/15. The camel calves were sent for grazing/browsing in addition to suckling, with their respective dams which received supplementation diets (grains and household refuse). Twice a day watering was done *ad libitum*. The animals were dewormed while sprayed fortnightly against external parasites. The mean daily weight gain (DWG) was 580 ± 90 and 490 ± 70 gm for male and female

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calves, respectively. The mean birth weight and weaning weights were observed as 38.16 ± 0.54 , 33.48 ± 0.56 and 258.67 ± 8.86 , 236.72 ± 7.18 kg for male and female calves, respectively. Regarding husbandry practices colostrum feeding was only observed in 16% of the calves as there was a taboo of calves being not fed until their dams had passed the placenta. One hundred percent of the calves were allowed to suckle from two teats of their dams, while in 90% of the cases, the suckling time was restricted. The weaning age was 8-12 months in 34% of the calves, and 12-16 months in 66% of the calves. Only 20% of the owners were found to practice deworming. The major issue was calf mortality observed in 25% of the cases. In ethnoveterinary practices, the diseases found to be seasonal and for their cure variety of treatments were adopted like usage of medicinal plants, larvicides, pesticides, fly repellents, odorants, cauterization and supportive therapy including *cold and hot drinks*, *hot food*, *yogurt* and *desi ghee*. The present results are of importance which could be used for further studies.

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Introduction

Livestock sector is involved in socio-economics of landless, poor and rural herdsmen; thus, could play a major role in poverty alleviation (Faraz et al., 2019a). The camel, a chief livestock species especially for arid, semi-arid and desert areas where they are considered as source of food security and sovereignty (Faraz et al., 2019b). Generally, camels rearing based upon pastoral farming as cameleers are constantly moving for feed resources (Omer et al., 2008; Faraz et al., 2019c). Camel is well recognized due to its indispensable role in the pastoral ecology and marginal areas; hence needs to be preserved properly (Faraz et al., 2022a). To meet the inflated demands of growing population, the strategy is to develop own feeding resources and to mitigate the reliance on exterior stockpiles (Faraz et al., 2022b). It is necessary to recognize the camel place and focus to obtain higher production from indigenous resources yet not fully utilized (Faraz et al., 2019d). Pakistan is bestowed with 1.1 million heads (95% dromedaries) ranking number 8 among the top countries in world (GOP, 2020-21; FAOSTAT, 2019). Mostly camels are raised in pastoral system especially in Thal and Cholistan Deserts. The comprehensive data about proffering traits and related parameters in pastoral farming under natural habitat is lacking in literature data. So, for country's primary database buildup it seems very important to have records on production. Hence, this study was portrayed for the basic information regarding productive parameters and husbandry practices of Marecha dromedary camel calves under diverse extensive conditions.

Material and Methods

Meteorological Conditions: The Camel Breeding and Research Station Rakh Mahni is situated in desert Thal which is classified as zone III of agro-ecological region having arid climate, with highest temperature as 45.6 °C falling from 5.5 to 1.3 °C in severe winter. The rainfall is increasing from south to north and ranges between 150 to 350 mm (Rahim et al., 2011).

Data Collection: About one hundred herdsmen keeping Marecha dromedary camel calves were incorporated in study during months of April to June. After clinical examination, the healthy animals were included in the trial. In addition to suckling, the calves grazed for

Productive parameters of camels

ten hours daily along their dams who received supplementation diets (grains and household refuse). Twice a day watering was offered *ad libitum*. The animals were dewormed while fortnightly spraying was done against external parasites. The weight measurements (birth and weaning weight, daily weight gain) were taken by using an Impressum digital weighing scale. The daily gain was calculated as current weight-previous weight/15 by fortnightly weighing. The data about different husbandry and ethnoveterinary practices was collected by using a single-visit-multiple-subject diagnostic pretested questionnaire that includes the information about colostrum feeding, suckling time and frequency, weaning age, deworming, calf mortality, prevalent common diseases and ethno veterinary treatment.

Statistical Analysis: Data was compiled by Microsoft Excel (Microsoft Office 2010) and major contributions of dromedary calves were ranked by standard procedures defined by ILCA (1990). Parameters of pastoral farming were derived in terms of descriptive-statistics (mean \pm standard deviation and percentage) and derived by SPSS (Steel et al., 1997; Gecer et al., 2016).

Results

Growth Rate: The mean and range were 580 ± 90 , 490 ± 70 and 490-670, 420-560 gm for male and female Marecha calves, respectively (Table 1). Tandon et al. (1988) reported alike findings of DWG viz: 400 & 720 gm during one year and seven to eight years age respectively in Bikaneri dromedary camels. Reported DWG was 1400, 1500 gm and 950, 1000 gm in heavy male and female Pakistani camel calves, respectively (Knoess, 1977 and Qureshi, 1986). In contrast to present findings, reported DWG was 260 & 550 gm in camels feeding mangroves and high energy/protein diet (Kamoun, 1995). While under pastoral farming in Kenya, the reported DWG was 222 & 655 gm during initial days in dry and wet season, respectively (Field, 1979). The DWG was 410 and 380 gm up to sexual maturity while 120 and 60 gm after sexual maturity respectively in males and females while it was around 0 after reaching the adult weight (Musavaya, 2003).

Table 1. Average daily gain, birth and weaning weights of Marecha camel calves in Desert Thal, Punjab

| Parameters | Mean | Range |
|--------------------------------|-------------------|---------|
| Growth rate (σ) g | 580 ± 90 | 490-670 |
| Growth rate (ϕ) g | 490 ± 70 | 420-560 |
| Birth weight (σ) kg | 38.16 ± 0.54 | 34-51 |
| Birth weight (ϕ) kg | 33.48 ± 0.56 | 30-39 |
| Weaning weight (σ) kg | 258.67 ± 8.86 | 197-353 |
| Weaning weight (ϕ) kg | 236.72 ± 7.18 | 186-249 |

In India, reported DWG was 700 and 770 gm during initial days in Jaisalmeri & Bikaneri calves, respectively (Khanna et al., 2004). There are large variations regarding DWG of camel calves; widely varied between and within breeds of different geographical regions. Hammadi et al. (2001) reported 580 gm (0-3 months age) while Bissa (1996) reported 733 gm DWG (0-6 months age) in Indian dromedary calves. The documented values are found to be lower than of cattle but it is well proved that camels are usually reared under pastoral farming. The reported DWG was 720-860 gm in Ethiopian dromedary calves (Zelege and Bekele, 2001). Kadim et al. (2008) reported DWG as 500 gm in dromedary calves.

Male calves were found to be heavier than female calves as sex has significant contribution in DWG (Baniwal and Chaudhary, 1983) may be due to the testosterone effect that increase the production of erythropoietin from kidneys which in turn accelerates the erythropoiesis. Reported DWG was 870 and 570 gm from 0-30 and 0-180, respectively in Kenyan dromedary calves (Wilson, 1992). Reported DWG was 830-970 gm from 0-180 days in Egyptian dromedary calves (El-Badawi, 1996). Reported DWG was 611 gm in intensive kept while 319 gm in semi-intensive kept Indian dromedary calves (Bhakat et al., 2008). Reported DWG was 535 ± 9.83 and 317 ± 5.46 gm in semi-intensive kept and traditional kept Sudanese dromedary calves, respectively (Bakheit et al., 2012). Reported DWG was 350 gm in grazing Sudanese camels (Mohamedain et al., 2015).

In very recent studies, Faraz et al. (2018) found higher growth rate about 674 gm/d in male calves of 11-12 months age reared under intensive system while 419 gm/d in semi-intensive conditions. In another study of Marecha dromedary calves of 11-12 months age, the reported values were 397 gm/d in semi-intensive while 539 gm/d in extensive conditions (Faraz et al., 2017). Faraz et al. (2019e) reported significant differences in average daily gain of male and female calves of 11-12 months age, as being higher in intensive than semi-intensive conditions. Faye et al. (2018) reported DWG as 509 gm/d in control while 414 gm/d in date-urea blocks treated group in 36 months old camel calves. In very recent studies, Faraz et al. (2020) reported very close results of daily weight gain as 480 and 520 gm in open grazing and stall-fed system, respectively. The reported DWG of ♂ and ♀ camel calves was 670, 650 and 540, 440 gm respectively in intensive and extensive conditions (Faraz, 2020).

Birth Weight: Mean birth weight and range of male and female Marecha dromedary calves were 38.16 ± 0.54 , 33.48 ± 0.56 and 34-51, 30-39 kg, respectively (Table I). Present results support the findings of Wilson (1978) who reported 35 kg while Bissa et al. (2000) reported 39 kg weight at birth in Indian dromedary calves. Moreover, the birth weight greatly differs between and within breeds as well as in regions. Reported birth weight was 42.15 ± 0.77 and 38.82 ± 0.64 kg respectively in male and female Indian Bikaneri calves (Khanna et al., 2004). Reported average birth weight was 35 kg in dromedary calves (Kadim et al., 2008). A different range (26-28 kg) was reported in Somali & Tunisian dromedary calves (Field, 1979; Simpkin, 1983; Hammadi et al., 2001). Contrary to DWG, a mere effect of sex on weights at birth was postulated in dromedaries (Ouda, 1995) while patterns of prenatal growth are alike cattle (Musa, 1969). The meat outputs from breeding females is limited due to long gestation and milk feeding periods, lower calving rates under traditional management conditions. The birth weight range (27-39 kg) of dromedaries is comparable to tropical cattle.

Weaning Weight: Mean weaning weights and range were found to be 258.67 ± 8.86 , 236.72 ± 7.18 and 197-353, 186-249 kg, respectively in male and female Marecha dromedary calves (Table I). Reported weaning weights were 212 and 204 kg for male and female dromedary calves, respectively when weaned at 14 months age (Musavaya, 2003). The optimum weaning age was determined as 8 months and better post weaning growth could be achieved by supplementation up to one-year age (Chibsa et al., 2014). The slaughter weight is the ultimate result of successive growth which forms the basis for meat production. Different factors like breed, sex, nutrition and health influence the growth rate. A main factor is heredity which affects the prenatal growth directly by genotype of fetus or indirectly by genotype of dam (Shalash, 1988). Various factors like vegetative growth,

Productive parameters of camels

managerial conditions, availability of milk and husbandry practices affect the pre and post weaning growth rates on which the final body weight depends (Babiker and Tibin, 1989), while it is partially dependent on availability of browsing species throughout the year (Wilson, 1998). Higher mortality rates and lower DWG are the major constraints in productivity of dromedary herds (Ismail, 1990). A decrease in nutrients intake affects the calf growth hence delays the onset of puberty (Formigoni et al., 1996). It is concluded that camels grow better at age of one to three years rather than three to five years (Simpkin, 1985), so for feedlots, the selected population should be in initial age. Mainly genetics governs the intrinsic ability of growth but could be supplemented with adequate nutrition and management (Khan and Iqbal, 2001).

Husbandry and Ethnoveterinary Practices The colostrum feeding was observed only in 16% of the calves, as the herdsmen have a taboo of calves being not fed until their dams had passed the placenta which was the major reason found for calf mortality. Even people don't know that prompt milking after calving support the passage out of placenta. One hundred percent of the calves were allowed to suckle from two teats of their dams, while in 90% of the cases, the suckling time was restricted. The weaning age was 8-12 months in 34% of the calves, and 12-16 months in 66% of the calves. Only 20% of the owners were found to practice deworming as the cameleers mostly rely on ethnoveterinary practices, may be due to lack of knowledge but mostly for the non-availability of extension services. The major issue was calf mortality which was observed in 25% of the cases and the main reason of that was under and overfeeding causing digestive problems. Due to lack of colostrum feeding, may be the immune system of calves were not so strong while there the chances of parasitic infestation are more. Most of the cases don't seek medical care but only the house remedies and ethno-treatments. In ethnoveterinary practices, the diseases found to be seasonal and for their cure, there is variety of treatment methods which were adopted like usage of medicinal plants, larvicides, pesticides, fly repellents, odorants, cauterization and supportive therapy including *cold and hot drinks, hot food, yogurt and desi ghee*.

Conclusion

Reasonable gains were observed in camel calves under extensive conditions that is a clear indication of the potential of Pakistani camel which can be manipulated by better husbandry conditions. Thal Desert is the food basket richest in indigenous livestock resources. Marecha is most favorite camel breed raised here, herdsmen raise this breed as aesthetic preference. Utility of this food animal is still limiting due to different socio-economic and anthropological reasons. Indeed, for lack of information in regards the levels of camel-welfare in various housing conditions (Previti et al., 2016) their production potential and profitability may be devalued as the needs may not be fully satisfied and their health conditions might be affected by neglected practices (Pastrana et al., 2020). So, extension services are badly needed about management, feeding, breeding, clean water therapy and treatment and these should be provided to the cameleers for proper management.

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